UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 52504

CSAH NO. 24

OVER THE

MINNESOTA RIVER

DISTRICT 7 - NICOLLET COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The concrete surfaces of the substructure units inspected at Bridge No. 52504, Piers 1, 2, and 3, were found to be in good condition with no defects of structural significance observed. Local scour was observed at Piers 2 and 3 with no footings exposed at the piers. Overall, the channel bottom appeared stable with only the instances of minor scour at the two piers.

INSPECTION FINDINGS:

(A) Overall, the concrete below water was in good condition with no structurally significant defects observed.

(B) A scour depression was observed around the upstream nose of Pier 2 and measured up to 3 feet in depth by approximately 4 feet in radius.

(C) A scour depression was observed around the upstream nose of Pier 3 and measured up to 3 feet in depth and approximately 4 feet in radius. The depression extended approximately halfway along the north face of the pier as well.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 52504

Feature Crossed: The Minnesota River

Feature Carried: CSAH No. 24

Location: District 7 - Nicollet County

Bridge Description: The bridge superstructure consists of a five span, multiple steel girder structure supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and four reinforced concrete piers. The piers are supported on spread footings. The piers are numbered 1 through 4 starting from the north end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Clayton G. Brookins, Michelle D. Koerbel

Date: November 1, 2002

Weather Conditions: Sunny, ± 35^{o} F

Underwater Visibility: ± 3 Feet

Waterway Velocity: ± 0.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3.

General Shape: The piers each consist of an oblong rectangular shaft with rounded ends supporting a hammerhead pier cap. The piers are supported by rectangular spread footings.

Maximum Water Depth at Substructure Inspected: Approximately 5 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 2.

Water Surface: The waterline was approximately 29.6 feet below reference. Assumed Waterline Elevation = 70.4.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 8

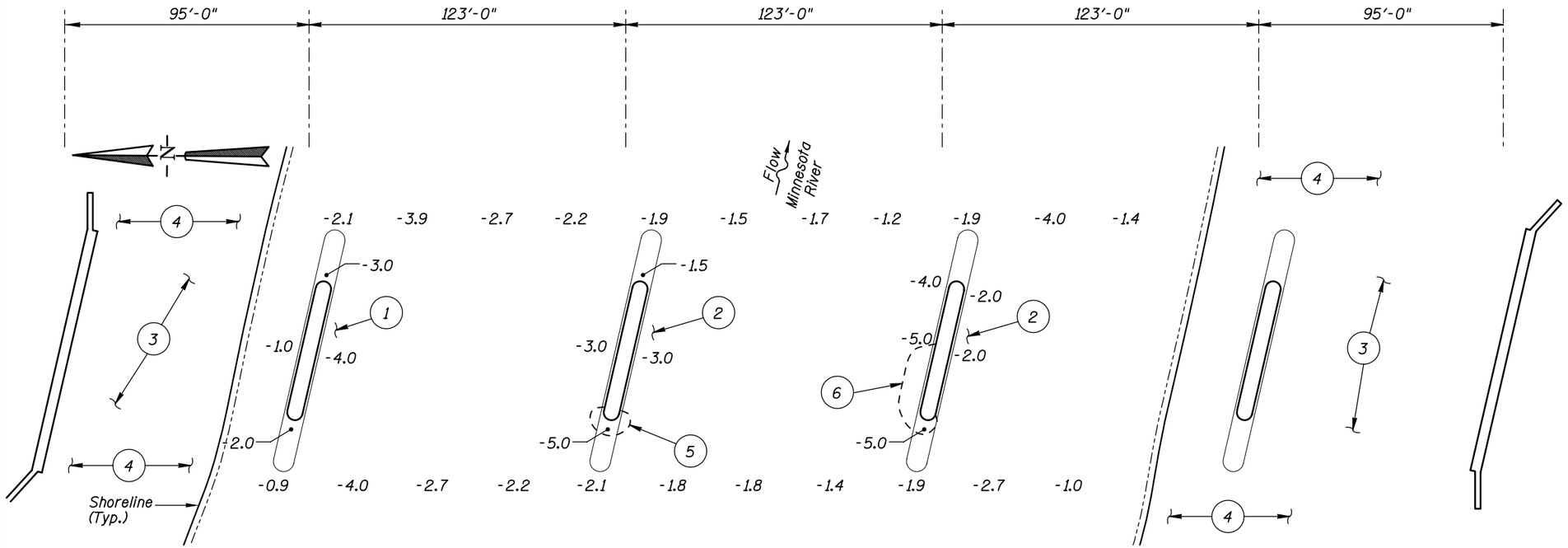
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/11/02

Item 113: Scour Critical Bridges: Code M/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes __X__ No



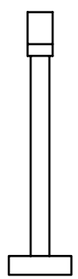
SOUNDING PLAN

INSPECTION NOTES:

1. The channel bottom material around the pier consisted of silty sand with up to 2 feet of probe rod penetration.
2. The channel bottom material around the pier consisted of sand with up to 1 foot of probe rod penetration.
3. The riverbanks beneath the bridge consisted of silty sand along the shoreline with riprap extending from the shoreline back to the abutment walls.
4. The upstream and downstream banks of the bridge exhibited steep vertical erosion of the banks.
5. A scour depression was observed around the upstream nose of the pier and measured up to 3 feet deep by approximately 4 feet in radius.
6. A scour depression was observed around the upstream nose of the pier and measured up to 3 feet deep and approximately 4 feet in radius, and extended approximately halfway along the north face of the pier.

GENERAL NOTES:

1. Pier 1, 2, and 3 were inspected underwater.
2. At the time of inspection on November 1, 2002, the waterline was located approximately 29.6 feet below the top of the pier cap at the downstream end of Pier 2. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 70.4.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.



TYPICAL END VIEW OF PIERS

Legend

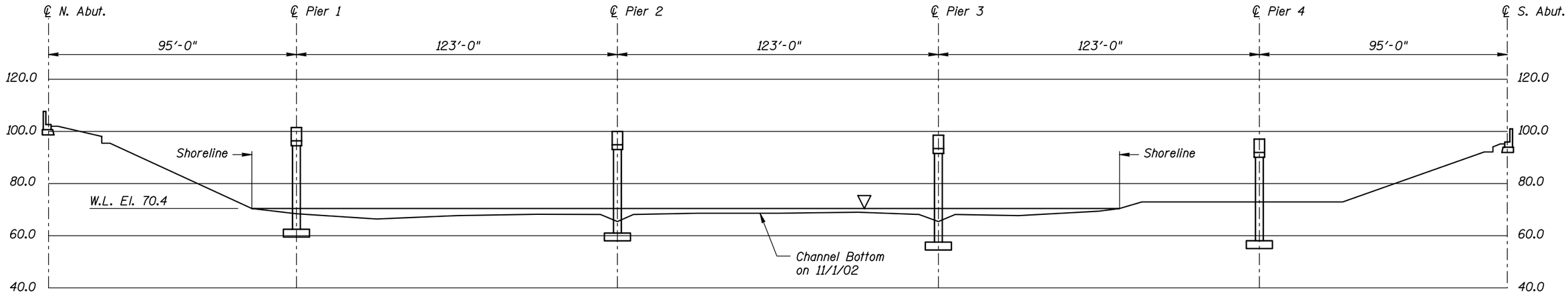
-5.2	Sounding Depth from Waterline (11/1/02)
( )	Scour Depression

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

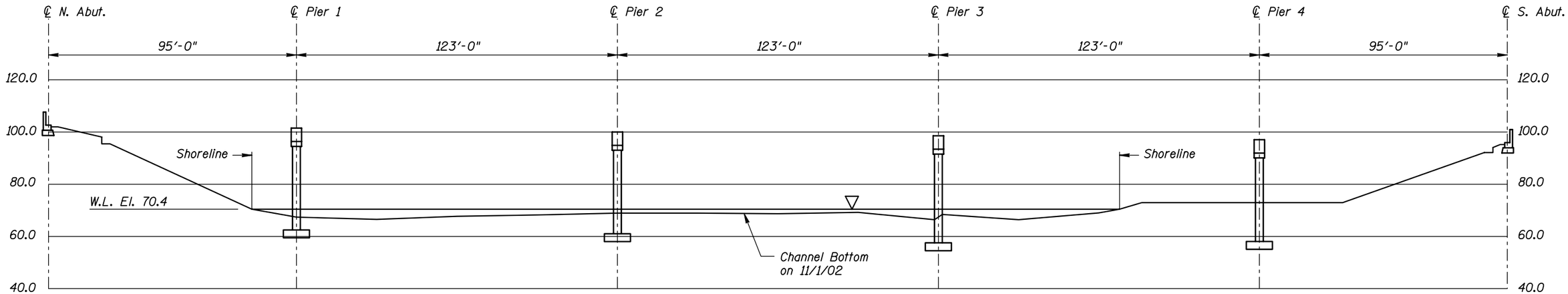
STRUCTURE NO. 52504
OVER THE MINNESOTA RIVER
DISTRICT 7, NICOLLET COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: NOV. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 351252504		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 52504
OVER THE MINNESOTA RIVER
DISTRICT 7, NICOLLET COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	**COLLINS ENGINEERS, INC.**	Date: NOV. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=40'
Code: 351252504		Figure No.: 2

Photograph 1. Overall View of the Structure, Looking Northwest.

Photograph 2. View of the North Embankment, Looking Northeast.

Photograph 3. View of Pier 1, Looking Northwest.

Photograph 4. View of Pier 2, Looking Southeast.

Photograph 5. View of Pier 3, Looking Southeast.

Photograph 6. View of Pier 4, Looking Southeast.

Photograph 7. View of the South Embankment, Looking West.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: November 1, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 52504 WEATHER: Sunny, "35° F
WATERWAY CROSSED: The Minnesota River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Clayton G. Brookins, Michelle D. Koerbel
EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera
TIME IN WATER: 3:15 P.M.
TIME OUT OF WATER: 3:40 P.M.
WATERWAY DATA: VELOCITY "0.5 f.p.s.
VISIBILITY "3.0 feet
DEPTH 5 feet maximum at Piers 2 and 3
ELEMENTS INSPECTED: Piers 1, 2 and 3
REMARKS: Overall, the concrete below water was in good condition with no structurally significant defects observed. A scour depression was observed at the upstream nose of Pier 2 and measured 3 feet deep by approximately 4 feet in radius. In addition, a scour depression was also observed on the north side of the upstream nose of Pier 3 and measured 3 feet deep by approximately 4 feet in radius and extended halfway along the north face of the pier. No footing exposure was present within the scour depressions.

FURTHER ACTION NEEDED: _____ YES ____X___ NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 52504
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Minnesota River

INSPECTION DATE November 1, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	4.0’	N	8	N	9	N	8	8	8	8	N	N	8	N	N	8	N	N
	Pier 2	5.0’	N	8	N	9	N	8	7	N	N	N	7	8	N	N	8	N	N
	Pier 3	5.0’	N	8	N	9	N	8	7	8	8	N	7	8	N	N	8	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete below water was in good condition with no structurally significant defects observed. A scour depression was observed at the upstream nose of Pier 2 and measured 3 feet deep by approximately 4 feet in radius. In addition, a scour depression was also observed on the north side of the upstream nose of Pier 3 and measured 3 feet deep by approximately 4 feet in radius and extended halfway along the north face of the pier. No footing exposure was present within the scour depressions.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.